

Weekly Report for 09/22/2014

APS Renewal and Upgrade

- Prepared slides for meeting with G. Decker, N. Grossman, and K. Harkay discussing gas bremsstrahlung power measurements and implied pressure in ID vacuum chambers. This is for understanding MBA radiation limits. (Jeff Dooling)
- Simulated beam loss position due to various injection/extraction kicker faults scenario. (Aimin Xiao)

APS Machine Studies

Storage Ring Studies

- Performed orbit switch; BPM offset measurement for APS start up. (Aimin Xiao)
- Shift with S. Xu checking the new `s<n>bpmioc` databases, which will have the old bpm PVs removed. Updated AOP dependent files. (Louis Emery)
- For rf conditioning at startup, fixed injection by first doing on-axis injection plus correcting the large 2 mm and 1 mm orbits in x and y. These large orbit are unusual. (Louis Emery)
- Fixed a old SCR file that is still needed, but has deleted PVs in it. (Louis Emery)
- Prepared for a beam steering study with ID30 beamline. Requested control group to add a PV to the ID30 gateway. Gave Dejus some vertical orbit stability numbers for his ID30 calculations. (Louis Emery)

Linac Studies

- Worked on RG2 commissioning after gun 3G2 (Larry) is installed during last shutdown. Tuned beam at the RG2 front end to get sufficient charge transportation with good focusing down to FS1. worked on beam lattice setup down to the injection to PAR with sufficient charge for top-up operation. (Yin-e Sun)
- Took machine study shift on tuning up RG1 for top up operations. L2 power level fluctuates too much, and L4 modulator trigger timing needed to be adjusted to each 375 MeV. Nevertheless, good efficiency was obtained at the end of L2 and some shots has better than 90% through PAR. Stability needs to be improved once L2 and L4 RF issues are fixed. (Yin-e Sun)
- Tested the newly installed PC Gun beamline imaging diagnostics functionality. Found that the main and bucking solenoids polarity has discrepancy with SLAC's setup, documented the difference and sent to magnet group colleague; requested polarity check from the magnet group and they corrected the polarity of the bucking solenoid. (Yin-e Sun)

ITS Studies

- Worked on gun 3G1 that is currently installed at ITS. Activated the cathode to produce electron beams, transported the beam down to the end of the ITS beamline with good focusing and charge collection on the Faraday cup. (Yin-e Sun)

APS Machine Research and Development

Storage Ring Research and Development

- Calculated temperature rise in aluminum and titanium-alloy scraper models in MARS comparing both extended geometry and histogram definitions of voxel size (detectors) for recording energy deposition. (Jeff Dooling)
- Results are quite close especially for the titanium alloy. (Jeff Dooling)

- FO BLMs for SCU1 were received from Fiberguide Industries on Monday. (Jeff Dooling)
- Discussed rf power heating from high single bunch in MBA meeting. Discussed the need to document the bunch length used for other design requirements. (Louis Emery)

Linac Research and Development

- Did alignment work in the pc gun laser oscillator to recover operating conditions. Discussed problem with Y. Li (XSD) who offered useful suggestions for trouble-shooting the problem. (Jeff Dooling)
- Worked on the lattice setup for the PC gun beam in APS linac. Found good lattice setup for the low charge PC Gun beam down to LEUTL. (Yin-e Sun)
- Went through the work done on interleaving operations for PC Gun beam in linac (between sending beam to LEUTL and storage ring). (Yin-e Sun)

APS Machine Software

Storage Ring

- wrote SR Grid Xray BPM calibration for new ID sector S27 and S35, finished coding and tested with Bingxin Yang, it worked fine. And started working on 2-d scan per Bingxin's request. (Hairong Shang)

Injectors

- added Linac_PCGun data collection and plot to AcquireLinacWaveforms, ready for test. (Hairong Shang)
- worked with CY on booster start up ramp correction. (Hairong Shang)
- made the transfer work for IRamp in BRampControl (Hairong Shang)
- removed L1:PC1 from LTS device list in switch.tcl (Hairong Shang)

General

- generic controllaw was not able to start because the entries and options file were no longer executables after file system being updated, fixed the problem with Bob. And fixed the problem with booster longitudinal controllaw where the options file is a link, the link was broken when the fixing the executable property of options file, also the linked options file should be executable. However, called by the operator again the second day because they could not start controllaw again, debugged and found that the controllaw directory link was broken thus prevented starting controllaw, however, it was OK after several minutes. (Hairong Shang)

Publications, papers and report

- Provided data, images, and edits for MEDSI 2014 paper co-authored with J. Liu (AES-MED) and G. Waldschmidt (ASD-RF) discussing mechanical design for a new SR scraper. (Jeff Dooling)
- Submitted technote, ``Beam Loss Monitor Calibration at the ID6 Superconducting Undulator Prototype (SCU0)," AOP-TN-2014-046 with K. Harkay. (Jeff Dooling)

Meetings, workshops, conferences, committees, LMS related, and reviews

- attended DWFEL meeting at AWA, collaborated on ASTRA wake field calculations. (Yin-e Sun)

- hosted photo-injector physics meeting. (Yin-e Sun)
- Attended Low-Emittance Ring Workshop in Frascati. Presented overview of APS-U. Chaired a session on design optimization. (Louis Emery)

Safety and Required Training

- ASD102 Tunnel Safety Training (Louis Emery)

Miscellaneous

- Am having D. Reigle (AES-IT) replace the hard drives of the Tektronix TDS5054 oscilloscopes (tekdp0`s) with solid state drives (SSDs) and add RAM to the CPUs. These scopes are used for BLM data acquisition. (Jeff Dooling)
- This upgrade makes the response of these units much faster on the network. (Jeff Dooling)
- Annual Leave Monday September 22nd. (Jeff Dooling)
- worked on performance appraisal (Hairong Shang)
- Summarized work performed during FY2014. Wrote document of accomplishment for annual appraisal. (Aimin Xiao)